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ABSTRACT

A case study of a particular approach to solving the problem of using data to improve decision making within a particular secondary schcol is presented. The first section of the paper describes: The Setting, The Original Model for the School, Original Commitment to Research and Evaluation, Teachers as a Focus of Effort, Inadequate Understanding of Research and Evaluation, Time for the R&E Staff to Work with Teachers, Inability to Link Data to Changes in Behavior, Few Possible Changes Are Under the Control of Teachers, Limitations on Teachers' Time, The Hidden Curriculum, The Decision to Focus on Administrators, Developing a List of Decisions, The Time-Line Board, The Sequencing Session, Data Identification, Making Decisions on Time, and Interim Conclusions. The second part of the paper presents Some More General Considerations Concerning the Ability of Schools to Change. (DB)

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A MODEL FOR DATA BASED SCHOOL IMPROVEMENT

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Introduction

This paper is a case study of a particular approach to solving the problem of using data to improve decision making within a particular secondary school. Throughout, I have taken liberties with the chronology in order to separate conceptually the activities. This is not a history. It is a set of reflections on a set of experiences. The paper has two major sections. In the first I will describe what I did, with some comments as to why, and with what effect. In the second I will develop some more theoretical notions, based on the experiences, about the hopefulness of the approach.

The Setting

For the two years previous to this I was the coordinator of research and evaluation at John Adams High School. Adams was the newest high school in Portland, Oregon, the fourteenth in the city. It was already under construction when a proposal written by a group of doctoral candidates at Harvard to establish a new kind of secondary school was read by the district superintendent. Eventually six of the group came to Portland to run Adams High School and to attempt to give their proposal a try. I was one of those. We had a regular attendance area, 1600 students by the second year, and with the exception of some flexibility with respect to the original hiring of staff, we operated under the same rules and regulations of other district schools, and with the

same financial support. The school was built on the edge of the model cities area. Approximately twenty-five percent of the student body was black.

The Original Model for the School

The original proposal for what became Adams High School was a conscious analogy to the teaching hospital. In the search for a new construct around which to design a school, we were struck by the historical record of at least the best teaching hospitals in the country. They appeared to have remained continually at the forefront of medical innovation for, in some cases, as long as fifty or sixty years. They appeared to have the capacity for organizational renewal, and for continual improvement, in stark contrast to the history of experimental schools which have a half-life of less than two years.

The characteristics of the teaching hospital which we attempted to deliberately model in education were: an institution which brings together the finest practitioners possible; an institution with a large training component; an institution with a built-in research and evaluation component that interacted regularly and continually with the practitioners; and the clinical professorship--joint appointments between Adams and surrounding universities, teacher training centers and research centers.

Original Commitments to Research and Evaluation

The commitment to becoming an experimental school meant in general an insistence that we have more than our own intuitive claims to support the value of anything we did. Operationally, there was to be implementation of a system for careful evaluation of programs; evaluation data were to be fed back into the decision-making process to improve the

operation of the school; and there was to be a mechanism for transferring generalizable findings to other schools. The design and implementation of these systems was my responsibility. As Coordinator of Research and Evaluation in the school, I was responsible for building research and evaluation into the ongoing operations of the school.

Teachers as a Focus of Effort

The initial approach was to focus on the teacher level, and to generate program evaluation data to be fed into the decision-making process. We started by translating the general research and evaluation goals into five questions to be the basis for our work with teachers:

1. In what ways do you want people (particularly students) to be different after their contact with you than they were before?

2. What would you be willing to accept as evidence that you had succeeded?

3. What would you regard as undeniable evidence that you had failed and therefore should make changes?

4. How might you go about gathering these kinds of evidence?

5. How can you gather evidence in a way which is meaningful to someone else?

These questions remain a good set for working with teachers. At Adams part of the teacher's professional responsibility was to answer these questions, but as the questions imply, the particular answers were to come from him. Research and evaluation personnel in their professional capacity were to help teachers in answering questions four and five, to insist on systematic and defensible procedures so that data gathered would be of sufficient quality to be convincing to people other than those involved in the particular aspect of Adams under study, particularly

to people outside the school. Teachers were to make use of the data in their decision making, and the quality and use of the data was to be more widely defensible.

Schools do not usually have forums for examining the decisions teachers make. On the assumption that the creation of a forum, which would enforce certain procedures and standards, would be a good way of creating a demand, and a reward system, for careful evaluation work by teachers, the research and evaluation division proposed the establishment of a mechanism for internal performance review, modeled on the "case presentation" of the teaching hospital.

This was called the Periodic Program Review Procedure. Every activity in the school was divided into programs (the district was also trying to implement PPBS at this time so we used the "program" designations of the PPBS budget) and a schedule was established whereby the head of each program (a teacher, department head, or team leader) would meet three times a year with the administrator of the division of the school which included the program. At these meetings the work of the program would be reviewed. The objectives of the program, where the program began with respect to those objectives, actions taken to achieve the objectives, and evidence of the achievement or nonachievement of the objectives would be discussed. At these meetings, in addition to the program head and the administrator, would be three teachers from three different programs. They would serve with the administrator as the review panel, to increase communication among different sections of the school and to bring a different perspective to the review of the program's work. Every teacher served on one review panel.

The intent was for the Research and Evaluation division to operate in support of this procedure, working with teachers and program heads to

specify objectives, helping gather a[illegible] prepare data for presentation at the review sessions, and helping in the interpretation of data. The five questions became the basis for meetings with teachers and program heads in which we attempted cooperatively to work out plans for the review sessions.

For a variety of reasons we abandoned the work at the teacher level:

Inadequate Understanding of Research and Evaluation

Hiring prospectuses for teachers had stated that research and evaluation were to be integral parts of the teaching role. Teachers would be expected to look carefully, systematically, and seriously at the relative effectiveness of what they did. In spite of discussions of this in the hiring interviews, a presentation about research and evaluation to the assembled faculty during the summer training session prior to the opening of school, and a substantial amount of individual work by myself, there was a major gap between our perceptions and the perceptions of most of the faculty. In general teachers regarded R & E as a third-party activity, their role being merely to allow researchers to come into their classrooms and to do their research. Most were willing to permit evaluation, to receive feedback data, and to discuss that data, but they did not see it as part of their job to contribute their time and energy to R & E, other than possibly discussing their objectives with myself and my staff. If we were willing to design the instruments, collect the data, analyze the data, and come talk to them about it, they'd listen.

In part this was a question of time. Teaching was very time-consuming at Adams, and allocating time for evaluation was not a high

priority when placed against the problem of what to do tomorrow. In part it was also a question of experience. In the past what experience teachers had had with research had been when researchers came in to administer tests or questionnaires, and they had never been expected, or able, to use the findings (if, indeed, they ever heard about them). Most had had no experience setting up systematic evaluation designs. If we received requests for help from teachers, they were almost inevitably of two kinds: requests for standardized tests to measure something or other ("We're starting a unit on water pollution Monday; is there some kind of test we can use to see what they learn?"); or they hoped to find some additional manpower to grade their teacher-made tests.

Time for the R & E Staff to Work with Teachers

Working with teachers on the basis of the five questions is very time-consuming for the evaluators. At a minimum it takes two or three hours to help a teacher move from his sense of what he wants to do in his next unit to some identification of what kinds of evidence might be relevant to determining whether he got to where he wanted to get, and to the sketching out of the kind of data collection techniques which would gather that data. There still is the problem of developing the actual instrument (crude though it may be), gathering the data, and analyzing it.

For the most part we found it was most effective for us to develop the first cut at the instrument, with the teacher editing it; for the teacher to collect the data; for us to help the teacher set up a way for organizing and analyzing the data, for the teacher to do the organizing and analysis, and for us to help the teacher interpret the data in terms of what changes he might make in the future.

Working with even one teacher in this interactive manner was very demanding in terms of time. I was able to find no way to shortcut the process; indeed, it often took several sessions to establish enough trust to even begin to do constructive work with a teacher, which made the time demands even greater. The teaching staff of the school numbered over eighty. The R & E staff numbered one person, half-time, the first year and five half-time people the second year. While I had the assistance of other people in varying degrees, the simple fact is that this interactive process seems essential, and yet there is no way a school can afford the number of people trained in R & E necessary to work closely with all teachers in a school.

Lack of time also did in the Periodic Program Review Procedure. After school was not a possibility. Many teachers coach, or run other after school activities; some have jobs; many go to school to work toward advanced degrees; there are days regularly set aside for teachers' association meetings, and faculty meetings; and what free late afternoons there are are usually taken up by additional planning for tomorrow's lessons. Some PPRP sessions were held after school, and virtually all of the participants reported them as extremely valuable, but we could not begin to schedule them all.

We were unable to find a way to free sufficient resources from the school's budget to hold the Periodic Program Review Procedure during school time. The cost of releasing teachers for each program review session for two hours three times a year would have been $5000 in substitute pay, let alone the cost of recording the results of the sessions and doing the analysis necessary to make the sessions oriented around data. We feel it is reasonable to expect that schools hold periodic

reviews of their work, and thus we think the procedure should be implemented during school time, using school resources. As a percentage of the total operating budget in the school, $5000 to $15,000 for holding review and evaluation sessions would not look unreasonable, but there is no such money in the ordinary school budget, and no "fat" place to slice it out.

Inability to Link Data to Changes in Behavior

Teachers, at least habitually, have little capacity to define the kinds of data which might be useful to them. Often when working with them individually, I would ask, "Assuming you could have any kind of information you wish, what kinds of information would you, as a teacher, like to have about your students?" The responses were usually abstract, more typical of social sciences research. They would request information on socio-economic status, on interests, or what a student's home life was like. Occasionally they would request data on reading level. My next step would be to ask what they would do differently in their class if they knew a particular bit of this information about a student. "Suppose you knew that Suzie's reading level was fifth grade and she was in your 11th grade social studies class. What would you do differently?" Very few teachers had any capacity to generate a plan about how to act differently in the face of such data, other than not to assign many books. Socio-economic data, or family data, of course, drew even more blanks. The only data which teachers could use at all was information about reading level and even then most of them felt inadequate when facing the prospect that they might have to teach reading in order to make constructive use of the data, to bring their students to the point that they were able to function in their class. They tended to respond that they weren't "reading teachers."

Few Possible Changes are Under the Control of Teachers

In the course of actual teaching during the school year, there are very few things which are within the power of the teacher to change, and such power as he does have, to change what he is doing is difficult to exercise responsibly. The major decision point for a teacher is often the spring prior to the school year when he decides what his course titles or units will be and orders books and materials (assuming that he even has the power to make those two determinations). There are usually no resources at the teacher level left to reallocate after the ordering is completed, and the lag time between ordering and receiving effectively precludes major changes during a school year. The greater the number of students a teacher has, the more time-consuming are changes, particularly those which involve some adapting of instruction to differences within the class.

Most of the constraints under which a teacher operates, he has no power to change. Students are usually not selected by him and transferring misplaced students to more appropriate settings is difficult. The daily schedule is usually established once for the entire year, and though at Adams we established several different schedules to provide some flexibility, the teacher still does not have the power to change the lengths of class time. A decision to take students on a field trip not only involves major ramifications within the schedules of the students if they are not back in time for their other classes, but interacts with more than a few state and school district regulations.

Limitations on Teachers' Time

If teachers had the time, they at least might be able to execute effective changes within their classes, within the constraints imposed

by the organization, and regardless of the lack of additional financial resources. If they could, they might be able to make use of data. Their decisions would be real decisions, in that they might be able to change what they were doing.

Unfortunately, this is not true at most schools, and was singularly untrue at Adams. Teachers are usually locked into a class every period but one, with a small break for lunch. The more committed the teacher, the more these periods of time are filled with planning lessons, grading papers, and dealing with crises.

At Adams there was, in addition, the emphasis common in most innovative schools on interpersonal relationships, on breaking down the barriers between teachers and students imposed by the rigidities of the traditional school; and the pressure and emotional cost of unrealistically high expectations.

The emphasis on interpersonal relationships took the form of a commitment to dealing on a personal level with virtually any and all student problems--leading to endless hours of rapping and counseling; and to the involvement of teachers in deliberating about many of the rules that teachers regarded as rigid and "dehumanizing" in ordinary schools. But the routine, rigid though it may be in traditional schools, handles a set of problems without much thought and conserves energy for what may be more important activities. At Adams teachers were involved in deciding how to do such things as take attendance, and this not only took time, it led to fights between groups of teachers lobbying for different approaches, exhausting negotiations, problems of enforcing adherence to any system finally adopted, and polarizing of the faculty which lasted far beyond the particular decision. In an essentially reactive way we had abolished many of the rigid, traditional

structures of schools which we felt hindered constructive interpersonal relationships only to find ourselves with nothing to put in their place which would allow the organization to function.

The high expectations had their effect, too. Adams attracted a crowd of teachers who had been rebels in other schools, fighting against the rigidity and constraints of the organization. At Adams they genuinely felt they had their chance, and they threw all their physical and emotional resources into trying to make Adams work.

Thus, what little time there usually is for teachers was more than consumed at Adams in a frenetic attempt to keep the place afloat and true to its commitments to students. Systematically gathering data to evaluate what we were doing, and attempting to make decisions based on it was not a high priority, and there was no way to protect time to permit it to happen, let alone to anticipate decisions long enough in advance to provide data.

Teachers often did try to make changes in what they were doing, but rarely were they able to carry them out well. When something did not seem to be going well, they would often try to switch completely over a weekend. The result would be that the next week was poorly planned, with inadequate materials, and the new approach would have minimally better effects.

Under conditions of overload, people tend to revert to those things that they know best, rather than to try to learn new patterns of behavior. The demand to learn a new pattern of using data in decision making was simply asking too much.

The Hidden Curriculum

We became more and more convinced after working in a school such as Adams that most of the influences on students lie outside the classroom. This is now widely called the "hidden curriculum." Once we permitted more freedom of expression by students outside of classrooms, the disparity between where students were and what was happening in classrooms was unavoidably obvious, and it confirmed the basic thesis of the hidden curriculum. From an evaluation standpoint, if what happened in classrooms was such a small component of the effect schools have on children, concentrating evaluation there in an effort to improve in-classroom decision making was a misallocation of resources.

The Decision to Focus on Administrators

For all of these reasons we decided to focus on providing information to support administrative decisions. There were fewer administrators; they had, for the most part, a better and more highly trained sense of what evaluation meant; they could more easily free up time (not that they weren't overloaded too, but they have more control over their daily schedules than do teachers and can protect blocks of time); there is more possibility of creating a forum for deliberating on decisions, because the decisions are more clear and more obviously scheduled; and more changes are under the control of administrators, particularly those having to do with the "hidden curriculum." The steps we followed to bring evaluation to the support of administrative decisions can be described as follows.

Developing a List of Decisions

We started by going to each of the administrators in the school and asking him to identify decisions that he saw himself having to make in

the next three months. This was an unusual request. The tremendously sapping demands of day-to-day operations almost never left time to think about decisions as much as three months in advance. After patient work and, in some cases, combing through school district literature to determine deadlines, we generated a reasonably complete list of all decisions which would be faced by all administrators. We circulated the master list, asked for any corrections or additions, and acted as if the result were the complete list. We anticipated that by repeating this procedure every three months for several years, the accuracy of the list would improve.

The Time-Line Board

We color coded the decisions by who in the organization was responsible for making that particular decision, and arranged all of these decisions on a master board with a three month time-line as a background. It immediately became apparent that once one decision was made, it locked in a number of other decisions, so which decision came first--the sequence--became the point of major contention.

The Sequencing Session

We arranged the decisions according to the rough target date that each decision maker had given us individually, and invited all administrators to a late afternoon planning session to work out the sequence and interrelationship among the decisions. We pointed out the ways in which one decision could constrain another and asked them to decide the order in which the decisions would be made. A decision, for instance, to have the required General Education course be three periods long rather than two constrained enormously other decisions about the

number of courses that could be offered, or during what periods of a day. A decision to stagger the scheduling of the required courses opened certain options and constrained others. A decision by guidance counselors to schedule forecasting at a particular time constrained greatly when we could make decisions about hiring people, or which courses to offer the following year.

The striking thing was our incapacity to think out the way in which decisions interacted. The question of which decisions ought to be made first involved important educational values--Are electives more important than required courses? Is it more important to find out what courses students want, and then hire teachers; or to hire teachers first? Is protecting an extra free period for team planning more important than offering more electives? To adequately deal with these questions, we needed an enormous amount of predictive information. What would be the effect if we did this this way rather than that? What would be the effect if students were required to take three periods of a subject rather than two? What would be the effect of having the Work Experience Program run both morning and afternoon? How would our staff's areas of certification fit with some of the alternatives?

Note that these kinds of questions cannot be answered by empirical data, at least not directly. Empirical data needs to be fed into a simulation to generate information about the ramifications of various alternatives, both alternative decisions, and alternative sequences of decisions. I know of no one who is seriously attempting to provide such data on the individual school level, and yet this was the kind of information we most critically needed.

In effect the research and evaluation division had become a planning division for the school. Through this decision-board technique administrators saw relationships between decisions, and began thinking about the effects of decisions, in ways they had not before. They also began asking for information which they could really see they could use in making the decisions. Our incapacity to provide them this information was strikingly obvious.

We did, in that initial session, bat out a particular sequence of decisions, but in many ways it was a "traditional" one. The session came in the spring of one year, as we were planning for the next, and we selected the same sequence we had used in planning previously. This is unfortunately all too characteristic of the way schools operate. In the absence of any information which would enable us to accurately see the consequences of making changes in the sequence, we went with the sequence we knew as familiar.

For each decision we identified when it must get made, and whose job it was to make the decision. Then the session ended.

Data Identification

In the following few weeks, we began to meet with administrators, asking them what kind of information they would like to have provided to them, in what form, for making the decisions that had been identified. We discovered again that like teachers, administrators could not often identify kinds of data they could use. And in many cases the kinds they wanted were totally beyond our capacity to provide. For a handful of decisions we were able to collect some empirical data and provide it to administrators before they made their decisions. When we did, this

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data was taken into account in making these decisions. In fact, by this time our problem was not getting the data used so much as keeping it from carrying too much weight. More certainty was placed on the data than the methodology would warrant. Attitude information, for instance, hastily collected with a hastily developed instrument, covering a not terribly complete random sample, carried a great deal of weight in the absence of any other information.

A fact of evaluation work to help decision making in schools is that there is no time, money or capacity to use any of the highly developed techniques for instrument development, validation, or statistical analysis, nor is there any capacity on the part of decision makers to use the additional increment of information provided by such highly valid and statistically well-analyzed instruments. Decision makers are most capable of using frequency counts, percentages, and cross tabulations. To provide them with much more information would require, just as a beginning, a lengthy training program to teach them what it meant, not to mention enormous resources devoted to R & E.

Making Decisions on Time

Three useful achievements were to get administrators to plan several months in advance, to sequence decisions, and to make decisions on time. Usually forty-eight hours before a decision point we sent a bright orange notice to each decision maker, reminding him that he was supposed to make a particular decision. We published a couple of times rating sheets giving for each administrator the percentage of their decisions that they made on time. We called these jokingly "ratings of administrative quality."

Interim Conclusions

I think I'm as good as the next evaluator in working with teachers and administrators to identify goals and objectives, think out decision points, identify kinds of data relevant to those decisions, and provide useful information in a form that the decision maker can understand. That the size of the school outran my resources was only part of the problem. The more critical problem was the absence of any way for people of greater ability and more good will than most to actually make changes in the operation of the school based on what information we did provide. Schools do not have a forum for deliberation about data. Much of the effort I spent went into the creation of such a forum, and yet once it was established, it only identified more strikingly how weak is our capacity to even identify, let alone generate, the kinds of data which would really provide an information base for such decisions; and it highlighted how limited was the control we really exercised over the school. Those who spend energy trying to get objectives more carefully specified and measurable should become more aware of the decision-making realities in schools. There is no likelihood that better objectives themselves will make any difference at all in schools, and until we can design schools to build in mechanisms for them to use data, working on objectives is a waste of time.

SOME MORE GENERAL CONSIDERATIONS CONCERNING
THE ABILITY OF SCHOOLS TO CHANGE

The change model represented by evaluation implies that feeding back information to decision makers will enable them to improve their decisions, and thus improve schools. How flexible is a school? How real are the decisions?

As a general proposition I would argue that any change takes additional resources. It costs something to change from an existing form to a new form beyond what it would take simply to maintain the existing form. It is reasonable to think of an organization as having resources of three kinds:

1. Financial
2. Time
3. Psychological capacity to cope with change

The capacity of a school to change is limited by the amount of free resources of each of these kinds which can be expended to bring about change.

Schools have such a limited supply of free resources of these kinds that my own view is that schools should conserve much more carefully these very limited resources. They should think very hard and long and plan very carefully any change. All of these resources can become overextended very easily. Once they do, the capacity for additional change is virtually nil; regeneration without some physical separation for R & R is very nearly impossible; and the school itself tends to fall back into traditional patterns (which frankly do limit the demands for extra time, money, or psychological energy). This, at any rate, is my explanation for some striking phenomena: alternative or experimental schools tend to last a very short time; virtually everyone who gets involved in the experimental or

alternative school movement has left within two years; of the original six Harvard doctoral candidates who founded Adams, only one remains (though two others remain active in other high schools); of the original seven team leaders at Adams, only two remain. My guess is the people burned themselves out trying to change too many things at once without sufficient resources.

At the risk of repeating the first part of the paper, let me cite some facts about Adams.

Financial Resources

Out of a total budget of around 1.7 million dollars to run Adams for a year, the administrators had control over something like $30,000. Of this some $26,000 could be spent only on textbooks. The remaining $4,000 dollars was labeled "minor building improvement" money and was vitually the only discretionary financial resource controlled at the building level. The biggest decision anyone could make at the building level was the purchase of materials for classes. Since the $26,000 was barely adequate for this, and there is approximately a six month lag time between ordering and receiving textbooks, all of these funds were usually allocated by March of the previous year. Once spent, students and teachers were locked into the materials which had been ordered. We did attempt at Adams to protect a certain amount of money for discretionary purchases during the year but obviously we had very limited capacity to do this.

We did not have sufficient control over our building to reorganize it to free up more financial resources. We could not, for instance, decide to fire two teachers, hire two aides and reallocate the money we had saved. We could not decide to abolish a department or set of classes and use that money on something else. Such decisions were beyond our control and were handled at the district level.

The school was allocated so many teachers on a ratio to the number of students in the building, regardless of the salaries of those teachers. Adams actually had a slightly better teacher-student ratio than most schools because we were a new school. The district usually gave new schools a little extra help. However, we received continual heat from other prinicipals who argued that we were being given privileged treatment, and the district supported the view that we had to be brought into line within three years. In terms of real dollars we had so many younger teachers with lower salaries that we were saving the district money, but this argument received no hearing at all.

Time

I have already explained at great length in the first portion of this paper how no one really had free time. It was a question of trying to set up ways so that evaluation had a higher priority in the competition for people's time than some other activity. This would be difficult to do in most schools; it was virtually impossible at Adams. In a curious way the more committed the staff is to change and flexibility, the less likely they are to have the inclination, skills, and discipline to plan and evaluate systematically. We all tended not to recognize that the decision to do one thing is a decision not to do a great many others. Setting priorities and goals which are reasonable within the constraints of the school and having the discipline to stick to them runs counter to the nature of the more liberal, counter-culture teacher who is usually attracted to open and experimental schools.

Again, we could find no way to reorganize our school, given such limited freedom as we had, to free up more time. Working in a large high school only makes more apparent that the only problems they have time to

deal with are logistical and custodial: what to do with sixteen hundred bodies for six hours a day. The existing structure of traditional schools is arbitrary and rigid precisely because it is the only way they can put that many human bodies somewhere for six hours within their resources.

We could not change that constraint. State law requires that every student attend school every day.

Psychological Capacity to Cope with Change

Anyone who has ever taught recognizes how psychologically demanding it is. No other profession requires anywhere near the amount of continual human interaction as does teaching. If someone has a methodology for studying the number of variations in an environment that a person can control continually over a large number of years, I would like to see it applied to a classroom setting. The notion of trying to adapt different instructional approaches to thirty different students with a variety of motivations and learning problems must be vastly beyond the capacity of a human being to maintain for any substantial period of time. The only possible survival mechanism would be to cut down drastically the number of variables and simply to manipulate those few.

One reason many career teachers develop extremely limited rigid and didactic methods of teaching may be that what these methods do is clap rigid controls on many of the variables in any instructional situation, so that the teacher can psychologically cope with the changes in the few remaining variables and can do that over a period of years to survive. There might be some variations in the pace that students are permitted to work through the textbooks; there might be some variations in the kinds of questions that are permitted to be discussed about the material that is covered; there might be some room for choice among topics that students would study in greater

depth; but the basic structure of the classroom and the course would be established at the beginning and adhered to rigidly by the teacher as a psychological defense mechanism. Students would be forced to conform. A number of rationalizations would develop around such procedures to argue that they were good for the student, but the real reason, I would argue, is one of psychological conservation for the long haul. Administrators have a greater capacity to cope with change only because their job is somewhat less psychologically demanding--at least they deal mostly with adults--and on occasion they can escape to meetings in other places, getting out from under the pressures of the immediate problems long enough to think. Psychological R & R for most staff in school settings is critical to allow any kind of fresh perspective on what one is doing.

The Larger the School, the More Difficult is Change

As size goes up arithmetically, the ramifications of any change go up geometrically. One of the striking things about the work we did with administrators was that most of the decisions for which we attempted to provide data were essentially logistical decisions. Even though by normal standards the faculty and administration were substantially more attuned to educational issues, the focus of most of the meetings was on how to accomplish a set of tasks and in what sequence they should be accomplished. There was very little contemplation of value questions as to whether those were an appropriate set of tasks to perform, and almost no data was provided for that consideration. There was similarly very little consideration of how well a particular task had been performed, so long as it hadn't disrupted the organization too badly. Rather the focus was on how do we get X done?

A critical question for education is, At what size do educational questions, rather than logistical ones, become the overriding force? My view is that it is at a much much smaller level than present high schools, such as a hundred students, five or six teachers, and a few aides, particularly if those one hundred students are there because they consciously choose that particular alternative.

Unfortunately, there is little likelihood that we can reach this size simply by creating small schools or "houses" within large ones. Among various experimental schools the Pennsylvania Advancement School has perhaps experimented most with the development of genuinely different approaches to instruction within a single building, and it has reluctantly concluded that each is much more constrained than if it had a separate building in which to operate. If, for instance, one group of teachers allows students freedom of choice of attending classes and others do not, not only do students in the non-free classes complain of unequal treatment, but students who don't attend classes continually disrupt the classes going on in other parts of the building.

The logistics of working out some change in the organization and handling of all the ramifications are such that it is no wonder schools have not tried it often. They usually limit themselves to changing textbooks or materials within a class, or implementing new classes. These are, so to speak, the interchangeable parts of schools. One can be unplugged, and a new one plugged in, with minimal expenditure of energy and time.

Generating Funding from Outside

Teaching hospitals operate with resources on a scale vastly beyond anything we even think about in education. We knew originally that we

would have no chance to give our model for schooling a real test without outside resources. Our experiences in trying to raise them, however, have a number of implications.

I was one of the clinical professors, holding a joint appointment with a research center an hour south of Portland. Though my office was at Adams, and most of my work was at Adams, I nevertheless spent on the average of one to two days a week at the research center. To the credit of that center, most of my energy was spent writing proposals, attempting to generate funding for joint projects between the research center and Adams.

However, no such funding materialized. It was extremely difficult to find funding agents in education who were willing to trust collective working arrangements among institutions in education, in spite of the fact that such collective arrangements seem theoretically necessary and have been necessary as a practical matter in virtually all other fields dealing with complex problems. In building a rocket to send men to the moon or in providing advanced knowledge to farmers on how to improve crop yields, we have been able to develop highly funded cooperative arrangements between a mass of different organizations to deliver such a service or product. In dealing with the problem of human learning, which is vastly more complicated than either of the first two, we have the most limited resource base and we have never been able yet to develop good, cooperative working relationships among organizations.

In addition, there are no funding agents anywhere in education who are willing to fund a good id to subsidize an approach to a problem at a level that permits mistake is not tied to rigid timelines or particular

products. Education funding works through the RFP, where the funding agent says what he wants and organizations respond to his definition of the problem.

In desperation, we attempted to piggyback what we wanted to do on top of grants to do other things. That is, we would respond to an RFP, get a grant to do something, and then try to find a way to use some of the money and personnel for things that we wanted to do. Such an approach does not work. We found that there were very few people, even in a staff hand picked and as competent as the one at Adams, who were capable of writing competitive proposals. And furthermore, once the proposal got funded, there were very few people capable of administering the grant. The demands of the servicing federal grants are extraordinary, from detailed budget keeping on which the district could provide very little help, to the filing of quarterly reports and various and sundry other kinds of formal and informal communications. I wish I had done a time and motion study that looked at the amount of top-level professional time actually applied to the work of a federal grant. I would guess that it is roughly fifteen to twenty percent of the person's time. The rest is spent servicing the paper work of the grant. In retrospect, it probably would have been better to simply give up the approach of trying to find outside money, though that would eventually have doomed what we wanted to do.

The Need for New Models of Schooling

Increased funding alone will not bring many changes to existing schools. They are so under-resourced that given their present structure, they are capable of absorbing enormous resources with virtually no change.

In the past, attempts at changing school concentrated on the development of new curricula to "plug" into the existing structure of school. What we now know about the "hidden curriculum" suggests that we should no longer be in the business of developing alternative curriculum modules from which schools can select as we should seriously be in the business of developing alternative modes of schooling from which communities can select. Indeed, we should entertain the possibility that communities would deliberately implement three or four (if not more) alternative models of schooling and allow selection and choice among them by students and parents according to which one seemed appropriate for which student.

Some sixty years ago, through massive funding, a few teaching hospitals were created which became, then, the model for medical practice throughout the country. In education, we have never seriously been about the task of designing a set of really alternative ways to structure schooling and then funding them massively, much as if we were about the task of building the atomic bomb or a rocket to the moon, allowing a great deal of loss, false starts, and so forth, until a decent model was developed which could then be replicated at much smaller cost. We should be. One of those alternative models would be a school designed to integrate research and evaluation into the operation of the school.

It could be argued that we were hopelessly naive to think that we could seriously establish a school analogous to a teaching hospital. But the attempt to try out an idea identifies its shortcomings and further develops the model. We know now how to go about establishing a school in which diagnostic and evaluative information about students could genuinely be used in thinking about instructional programs for

those students, and how to integrate research and evaluation into the the operation of schools. This is only one model, but it deserves a serious, heavily funded test. So, I'm sure, do others.

Some Areas of Needed Work

The problems of integrating the use of data into an organization that normally runs without it are, I hope I have shown, difficult. It would be far more productive to design a school initially with the necessary procedures part of the daily routine. The data necessary to support decisions ought to be generated routinely by the operations of a school, with no need for special interventions to generate data unless some previously unforeseen problem arose. A number of instructional systems, such as Project PLAN and IPI, generate a large quantity of data as part of their routine operation. Someone should try to generalize these notions to the operation of a total school.

The previous analysis suggested that changes require extra resources, free resources, which can be allocated to overcome resistance and inertia. A useful line of inquiry would be to attempt to identify how much discretionary money and time was necessary to successfully carry off different kinds of changes. There ought to be enough examples around of schools trying to change to make such a study possible, though finding successful changes may be more difficult.

I suggested that lack of money might be overcome if there were freed time. I would like to see this hypothesis investigated. Also, work should go to trying to find some way to organize a teaching staff in a school within our present resources to free up a significant amount of time. All previous attempts, such as team teaching, large group

instruction, and whatever, have generally ended up taking more time, not less, although they do heighten somewhat the commitment that people have to the operation of the school.

We know very little about the psychological cost of making changes, though Toffler's Future Shock supports my contention that there are psychological costs to coping with change. The incredible rate at which people appear to burn themselves out in alternative schools has made me very wary of wholesale change. At the very least we should attempt to learn more about the psychological effects on teachers and students of trying to change schools, and do what we can to compensate for them.

One move worth trying to increase a school's capacity to change would be to give each school control over the resources for its program. I have read recently of at least one public school system which is trying such an approach, with community boards to advise each of the principals and their staffs how to use the money that they have. If in these schools it is possible for such things as traditional programs to be completely eliminated, for older experienced teachers to be replaced by younger teachers to free up salary money, and for other kinds of arrangements to be made to free up resources, it has real potential. The principal, his staff, and the community board could then decide how to use those freed resources, and the particular kinds of programs might well be much more appropriate to their student body. The notion of small, relatively autonomous groups in control of public money is one that seems to be gaining increasing acceptance.

A second method worth trying to increase the possibility of change in schools would be to break the notion that every student must attend

every day. If students were permitted to come to school once or twice a week, we could immediately cut class sizes, even in crowded schools, to a third of their present size. Each teacher, if he only had ten students at a time, could then work out an individual program with each student, which the student would pursue more on his own than at present.

Given the increasing power of modern communication techniques, the notion that students must be brought to a central location and then moved physically from room to room in order to receive information is simply anachronistic. It is the assembly line model of automobile factories or other assembly plants. If information communication is the aim, there will very soon, if not already, be individual communication devices which can be hooked up to one's own television set, enabling a far finer experience of great literature, theater, or great music than a teacher can provide. Our present notion of teacher is as storyteller, communicator of information, like the 14th or 15th century wandering bards communicating the news. It too is long since anachronistic.

In so many ways class time is wasted at present. If one asked, independent of his knowledge of traditional schools, for what educational functions a grouping of one teacher and thirty students was most appropriate, it would be extremely difficult to find any educational function for which it was really optimal. Tutorial groupings, one teacher and one student, or small seminar groupings with one teacher and five to ten students for discussion purposes, or very large class sizes of six or seven hundred for films, or lectures are probably more appropriate for any of the various kinds of educational experiences than one teacher and thirty students.

In the absence of either of these two changes, our only hope to increase the capacity of schools to change is to have very carefully thought out models which squeeze every bit of freeable resource out of existing schools. Contrary to the opinions of a number of business people to whom I have talked who characterize schools as very wastefully run, I doubt that there is much fat in a school. Well thought out models might, of course, contribute to the other two changes mentioned above. State legislatures would more likely change laws on compulsory attendance and local school districts would more likely give local buildings control of resources if a carefully thought out plan for using such resources were developed.

Somewhat more can be done now to make existing schools amenable to change, and more could be done with a few changes in the constraints under which schools operate. However, until the organization has more freed resources and is better structured to make use of information to change what it is doing, the usefulness of feedback or evaluation for improving schools is suspect.